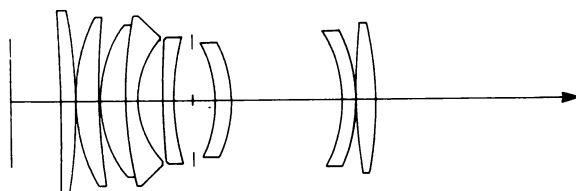


MINOLTA AF MACRO 100mm F2.8 (32) (2581-100)

MINOLTA MAXXUM AF MACRO 100mm F2.8 (32) (2581-600)

LENS



Construction : 8 elements in 8 groups
Type : — —
Coating : Minolta Achromatic
Angle of view : 24°
Lens mount : Minolta A mount
Lens signal contact : 5 contacts
Diaphragm : Automatic preset diaphragm
F No. : Maximum.....2.8
Minimum.....32
Full-stop setting.....7 stops
Diaphragm blade : 9 blades

FOCUSING

Focusing : AF, FA, M
Type : Double-floating focusing
Minimum focusing distance : 0.35m
Distance scale :

1.16	1.18	1.2	1.25	1.3	1.4	1.5	1.6	1.75	2	2.5	3	5	10	(ft)
0.352	0.355	0.36	0.37	0.38	0.4	0.42	0.45	0.5	0.6	0.7	1	1.5	3	(m)

Infrared correction scale : Yes
Depth-of-field scale : 32



DIMENSIONS & WEIGHT

Dimensions : $\phi 71$ (max. diameter) \times
98.5mm (max. length)
Weight : 520 g
Filter-thread diameter : 55mm (P=0.75)
Lens hood diameter : $\phi 55$ mm (Bayonet type)

ACCESSORIES

Lens case : LH-1034

I N D E X

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
2581-0035-----	4	2581-1110-----	3	2581-1363-----	1
2581-0040-----	4	2581-1112-----	3	2581-1364-----	1
		2581-1127-----	1	2581-1365-----	1
2581-0113-----	3	2581-1128-----	1	2581-1366-----	3
				2561-1367-----	1
2553-0240-----	1	2581-1130-----	2	2561-1368-----	1
2581-0244-----	2	2581-1131-----	3	2561-1369-----	1
2581-0371-----	3	2581-1230-----	1	2553-1372-----	1
2581-0386-----	3	2581-1232-----	3	2561-1376-----	1
		2581-1233-----	1	2581-1377-----	1
2581-0412-----	1	2581-1235-----	2	2581-1378-----	3
2581-0430-----	1	2581-1236-----	3	2561-1379-----	1
2581-1101-----	4	2581-1242-----	1	2551-1380-----	2
2581-1102-----	4			2581-1381-----	1
2581-1103-----	4	2581-1350-----	1	2581-1382-----	2
2581-1104-----	4			2581-1383-----	3
2581-1106-----	4	2581-1361-----	1	2581-1384-----	3
2581-1107-----	3	2581-1362-----	1	2554-1385-----	1

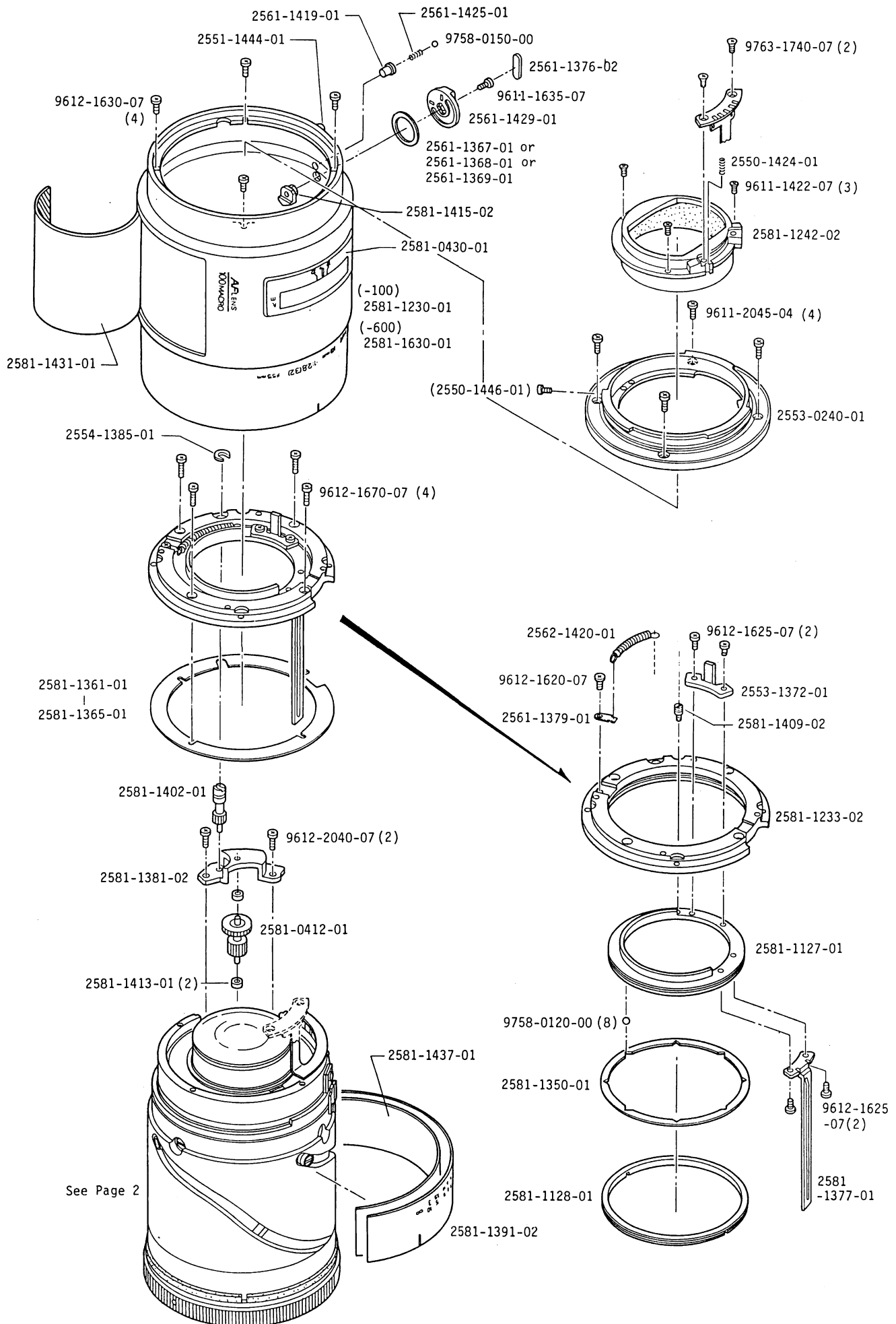
I N D E X

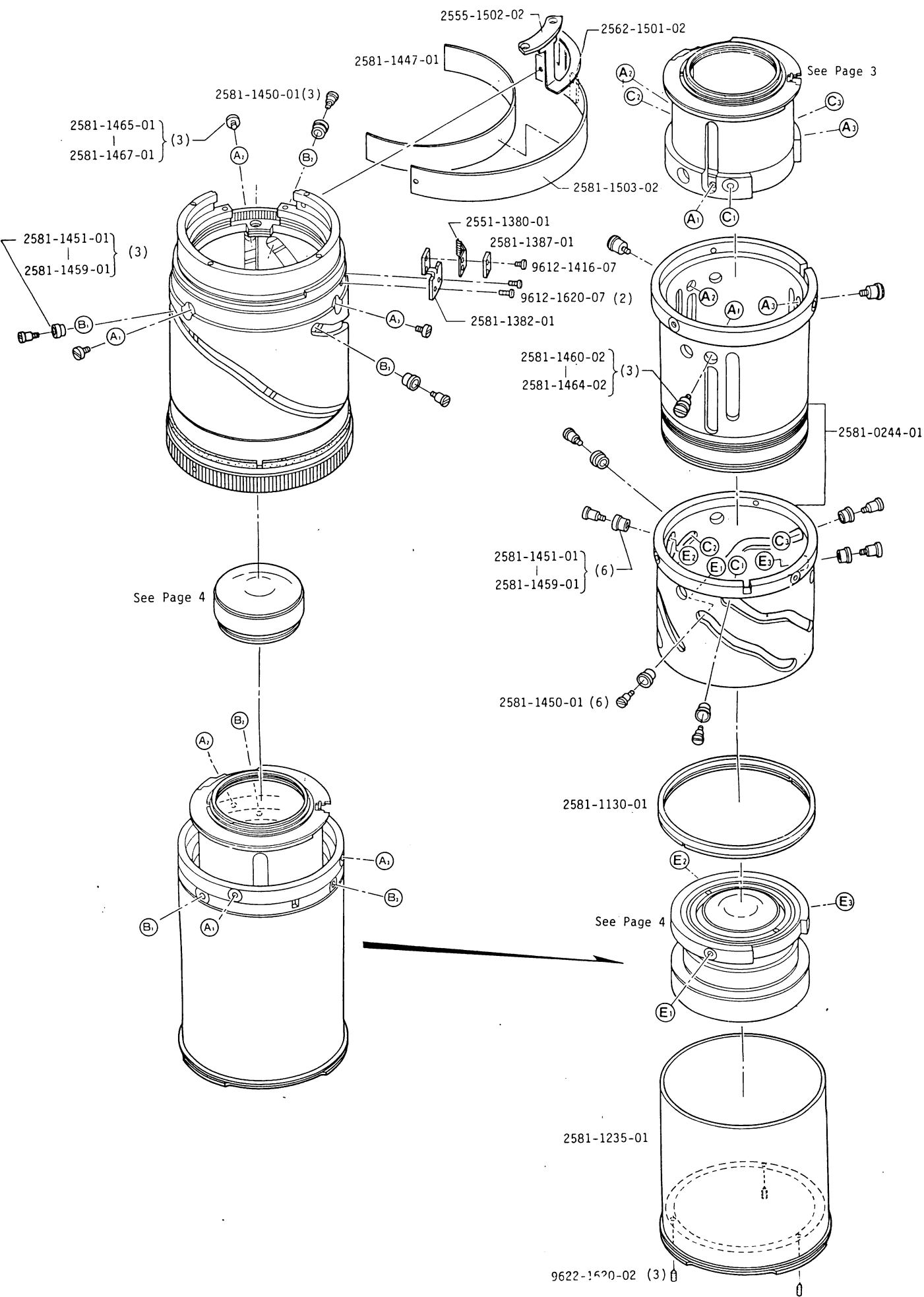
PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
2581-1387-----	2	2581-1431-----	1	2581-1460-----	2
		2581-1432-----	3	2581-1461-----	2
2581-1391-----	1	2581-1437-----	1	2581-1462-----	2
2581-1392-----	3	2581-1438-----	3	2581-1463-----	2
2581-1393-----	3			2581-1464-----	2
2581-1394-----	3	2551-1444-----	1	2581-1465-----	2
2581-1395-----	3	2550-1446-----	1	2581-1466-----	2
		2581-1447-----	2	2581-1467-----	2
2581-1402-----	1				
2581-1409-----	1	2581-1450-----	2	2562-1501-----	2
		2581-1451-----	2	2555-1502-----	2
2581-1410-----	3	2581-1452-----	2	2581-1503-----	2
2581-1413-----	1	2581-1453-----	2		
2581-1415-----	1	2581-1454-----	2	2581-1630-----	1
2561-1419-----	1	2581-1455-----	2		
		2581-1456-----	2	2581-1801-----	4
2562-1420-----	1	2581-1457-----	2	2581-1802-----	4
2550-1424-----	1	2581-1458-----	2	2581-1803-----	4
2561-1425-----	1	2581-1459-----	2	2581-1804-----	4
2561-1429-----	1			2581-1806-----	4

I N D E X

PART NO.	PAGE	PART NO.	PAGE	PART NO.	PAGE
9611-1422-07----	1				
9611-1620-07----	3				
9611-1635-07----	1				
9611-2045-04----	1				
9612-1416-07----	2				
9612-1620-07---	1, 2, 3				
9612-1625-07----	1				
9612-1630-07----	1				
9612-1670-07----	1				
9612-2040-07----	1				
9622-1620-02---	2, 3				
9622-1625-02----	3				
9758-0120-00----	1				
9758-0150-00----	1				
9763-1740-07----	1				

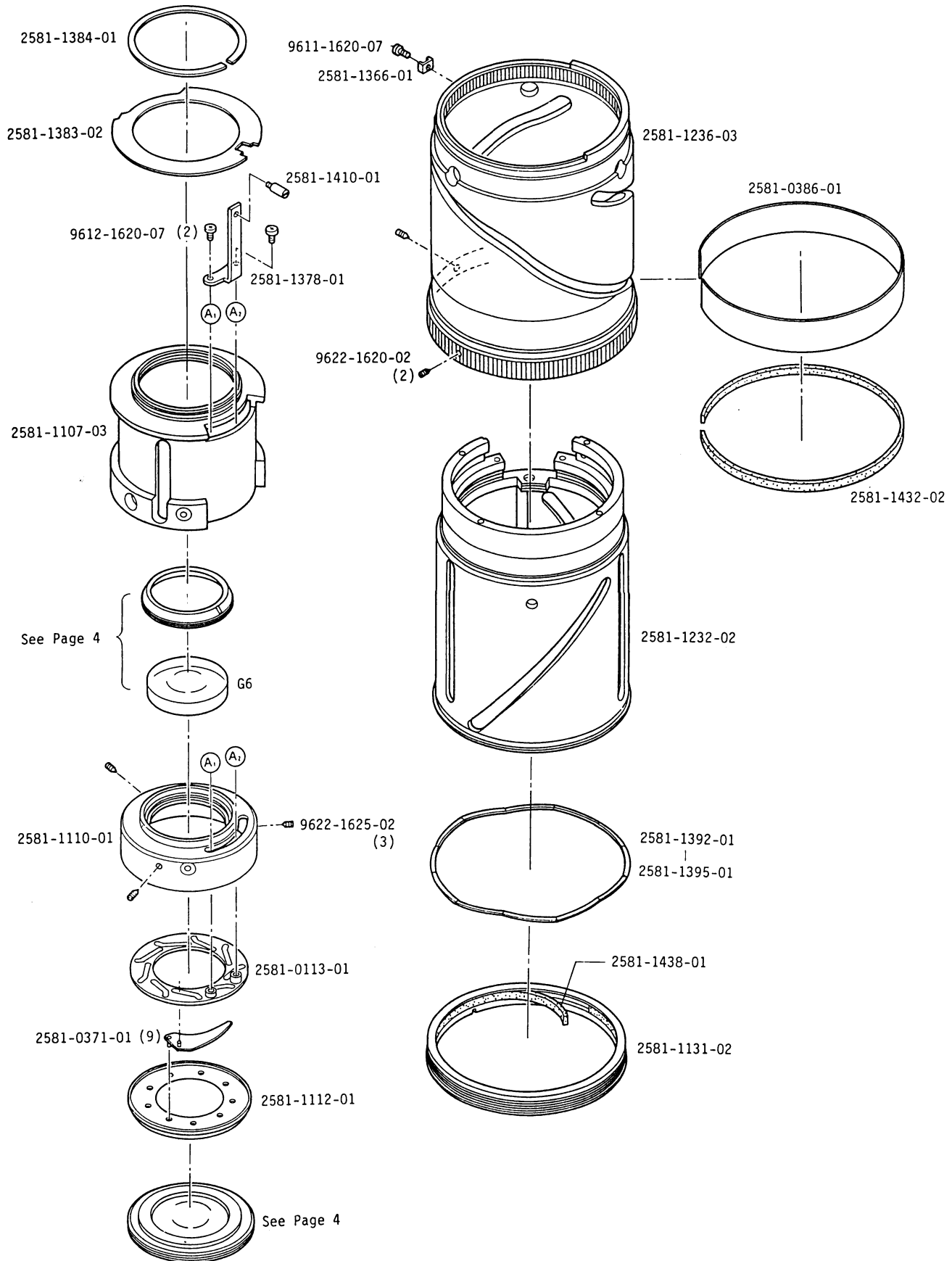
AF MACRO 100mm F2.8 (32) Code No.2581-100
 MAXXUM AF MACRO 100mm F2.8 (32) Code No.2581-600





Part No.	Part Name		Qty.
2553-0240-01	Bayonet mount set	バヨネットマウントセット	1
(2550-1446-01)	Screw	ストッパービス	1
2581-0412-01	Gear set	ギヤーセット	1
2581-0430-01	Distance scale window	距離表示窓セット	1
2581-1127-01	Preset ring	プリセットリング	1
2581-1128-01	Preset ring pressure	プリセットリング押え	1
2581-1230-01	Outer barrel	固定保持環	1
2581-1233-02	Outer ring	外筒	1
2581-1242-02	Light shield barrel	遮光筒	1
2581-1350-01	Diaphragm plate	絞りベアリング板	1
2581-1361-01	Back washer (t=0.05)	バックワッシャー	} Some
2581-1362-01	Back washer (t=0.07)	バックワッシャー	
2581-1363-01	Back washer (t=0.1)	バックワッシャー	
2581-1364-01	Back washer (t=0.2)	バックワッシャー	
2581-1365-01	Back washer (t=0.5)	バックワッシャー	
2561-1367-01	Washer-A (t=0.05)	ガタ調整ワッシャー A	} Some
2561-1368-01	Washer-B (t=0.1)	ガタ調整ワッシャー B	
2561-1369-01	Washer-C (t=0.2)	ガタ調整ワッシャー C	
2553-1372-01	Preset lever	プリセットレバー	1
2561-1376-02	Cover plate	飾り板	1
2581-1377-01	Diaphragm cam plate	絞り補正カム板	1
2561-1379-01	Spring hanger	メインSP掛け	1
2581-1381-02	Gear plate	ギヤー台板	1
2554-1385-01	C-washer	台板B	1
2581-1391-02	Distance scale plate	距離目盛板	1
2581-1402-01	Coupler	カプラー	1
2581-1409-02	Spring hanger	SP掛け	1
2581-1413-01	Receiver-B	軸受B	2
2581-1415-02	Focus range stopper	フォーカス範囲ストッパー	1
2561-1419-01	Click spring receiver	クリック座	1
2562-1420-01	Main spring	メインSP	1

Part No.	Part Name		Qty.
2581-0244-01	Cam ring set	カム環セット	1
2581-1130-01	Cam ring pressure	カム環押え	1
2581-1235-01	Lens barrel	鏡頭環	1
2551-1380-01	Brush	ブラシ	1
2581-1382-01	Brush holder	ブラシホルダー	1
2581-1387-01	Brush pressure plate	ブラシ押え板	1
2581-1447-01	Tape	テープ	1
2581-1450-01	Guide pin	案内ピン	9
2581-1451-01	Guide roller (D1=5.03 D2=4.53)	案内ローラー	9
2581-1452-01	Guide roller (D1=5.03 D2=4.52)	案内ローラー	
2581-1453-01	Guide roller (D1=5.03 D2=4.51)	案内ローラー	
2581-1454-01	Guide roller (D1=5.02 D2=4.53)	案内ローラー	
2581-1455-01	Guide roller (D1=5.02 D2=4.52)	案内ローラー	
2581-1456-01	Guide roller (D1=5.02 D2=4.51)	案内ローラー	
2581-1457-01	Guide roller (D1=5.01 D2=4.53)	案内ローラー	
2581-1458-01	Guide roller (D1=5.01 D2=4.52)	案内ローラー	
2581-1459-01	Guide roller (D1=5.01 D2=4.51)	案内ローラー	
2581-1460-02	Inner barrel pin (D=4.98)	内筒ピン	3
2581-1461-02	Inner barrel pin (D=4.97)	内筒ピン	
2581-1462-02	Inner barrel pin (D=4.96)	内筒ピン	
2581-1463-02	Inner barrel pin (D=4.95)	内筒ピン	
2581-1464-02	Inner barrel pin (D=4.94)	内筒ピン	
2581-1465-01	Straight guide pin (D=4.52)	直進案内ピン	3
2581-1466-01	Straight guide pin (D=4.51)	直進案内ピン	
2581-1467-01	Straight guide pin (D=4.50)	直進案内ピン	
2562-1501-02	IC (TOSHIBA, ML00G)	I C	1
2555-1502-02	Lens contact board	信号基板	1
2581-1503-02	Flexible PC board	フレキシブル基板	1
9612-1416-07	Phillips type screw	十字穴付なべ小ねじ	1
9612-1620-07	Phillips type screw	十字穴付なべ小ねじ	2
9622-1620-02	Screw	とがり先止めねじ	3



Part No.	Part Name		Qty.
2581-0113-01	Diaphragm operation plate set	絞り操作板セット	1
2581-0371-01	Diaphragm blade set	絞り羽根セット	9
2581-0386-01	Protection plate set	保護板セット	1
2581-1107-03	3rd. moving barrel	第3移動棒	1
2581-1110-01	Inner barrel	内筒	1
2581-1112-01	Diaphragm pressure ring	絞り押え環	1
2581-1131-02	Focusing ring pressure	距離環押え	1
2581-1232-02	Fixed barrel	固定筒	1
2581-1236-03	Focusing ring	距離リング	1
2581-1366-01	Stopper plate	ストッパー板	1
2581-1378-01	Diaphragm connect plate	絞り連動板	1
2581-1383-02	Light shield plate	絞り連動遮光板	1
2581-1384-01	Pressure plate	絞り連動遮光板押え	1
2581-1392-01	Torque adjust washer (t=0.15)	トルク調整ワッシャー	1
2581-1393-01	Torque adjust washer (t=0.2)	トルク調整ワッシャー	
2581-1394-01	Torque adjust washer (t=0.3)	トルク調整ワッシャー	
2581-1395-01	Torque adjust washer (t=0.25)	トルク調整ワッシャー	
2581-1410-01	Diaphragm connect pin	絞り連動ピン	1
2581-1432-02	Friction tape A	摩擦布A	1
2581-1438-01	Friction tape B	摩擦布B	1
9611-1620-07	Phillips type screw	十字穴付なべ小ねじ	1
9612-1620-07	Phillips type screw	十字穴付なべ小ねじ	2
9622-1620-02	Screw	とがり先止めねじ	2
9622-1625-02	Screw	とがり先止めねじ	3

■ When repairing following parts, must be checked resolving power by projection.

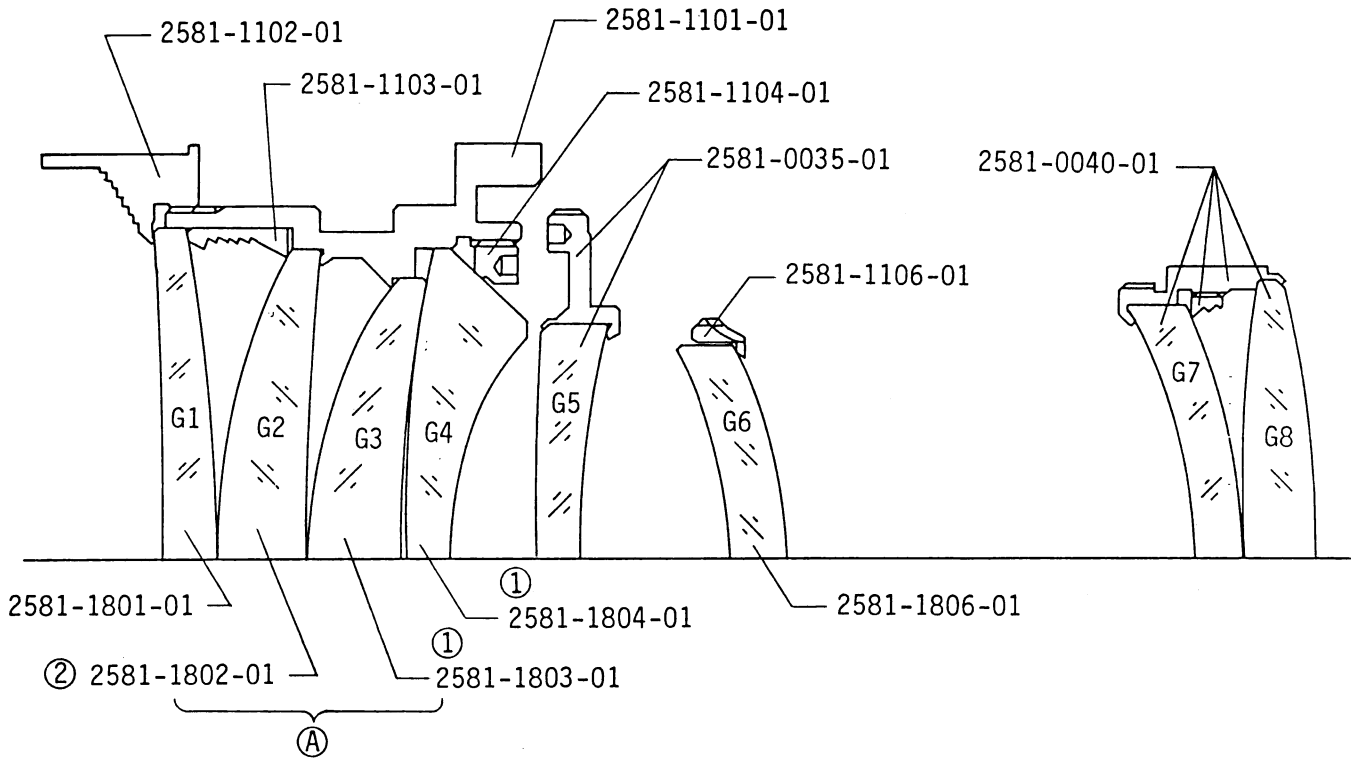
1 : The influential lens element in lens performance.(Number shows in order.)

A : The influential lens group in the lens performance.(Influence:In alphabetical order)

■ 下記部品を修理した場合は、必ず投影解像力を確認して下さい。

1 : レンズ性能によく影響するレンズ。(数字は順位を示す。)

A : レンズ性能によく影響するレンズ群 (影響度：アルファベット順)



Part No.	Part Name		Qty.
2581-0035-01	G5 lens barrel set	G 5 玉枠セット	1
2581-0040-01	Rear lens set	後玉セット	1
2581-1101-01	1st. moving barrel	第 1 移動枠	1
2581-1102-01	G1,2 pressure ring	G 1 , 2 押え	1
2581-1103-01	Spacer	間隔ワッシャー	1
2581-1104-01	G3,4 pressure ring	G 3 , 4 押え	1
2581-1106-01	G6 pressure ring	G 6 押え	1
2581-1801-01	Lens-G1	レンズ G 1	1
2581-1802-01	Lens-G2	レンズ G 2	1
2581-1803-01	Lens-G3	レンズ G 3	1
2581-1804-01	Lens-G4	レンズ G 4	1
2581-1806-01	Lens-G6	レンズ G 6	1

REPAIR GUIDE

- The contents of this manual are in accordance with the assembling procedure. Therefore, follow the reverse procedure when disassembling.

—Description of marks used—

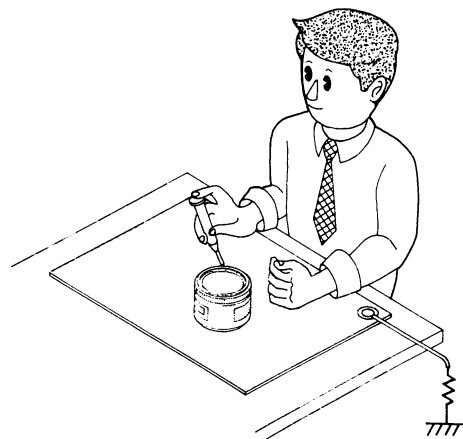
- B** : Adhesive
- S** : Solvent
- A** : Anti-diffusion agent
- G** : Grease
- T** : Tool
- : Point of assembling and general caution

■ Assembly and adjustment procedure

1 Diaphragm blades, Inner barrel, 3rd moving barrel	p. 1
2 Floating cam barrel, Straight cam barrel, Rear lens set	p. 2
3 Fixed barrel, Focusing ring	p. 3
4 Flexible PC board, Gear set	p. 4
■ Brush positioning	p. 4
5 Temporary assembly for aperture diameter adjusting, Outer ring set	p. 5
■ Aperture diameter adjusting, aperture diameter pre-checking	p. 5
■ Flexible PC board arranging	p. 5
6 Outer barrel, Bayonet mount, Light shield barrel	p. 6
7 Front lens set, Lens barrel	p. 7
■ Flange back (f'F) adjusting	p. 7
■ Projection resolving power checking	p. 7
■ Aperture diameter checking	p. 7
■ General function checking	p. 7
■ Flange back (f'F) adjusting procedure	p. 8
■ Flexible PC board replacing procedure	p. 9
■ Disassembling procedure to block unit	p. 10
■ Description of focusing	p. 11
■ Schematic circuit diagram, Printed wiring diagram	p. 12

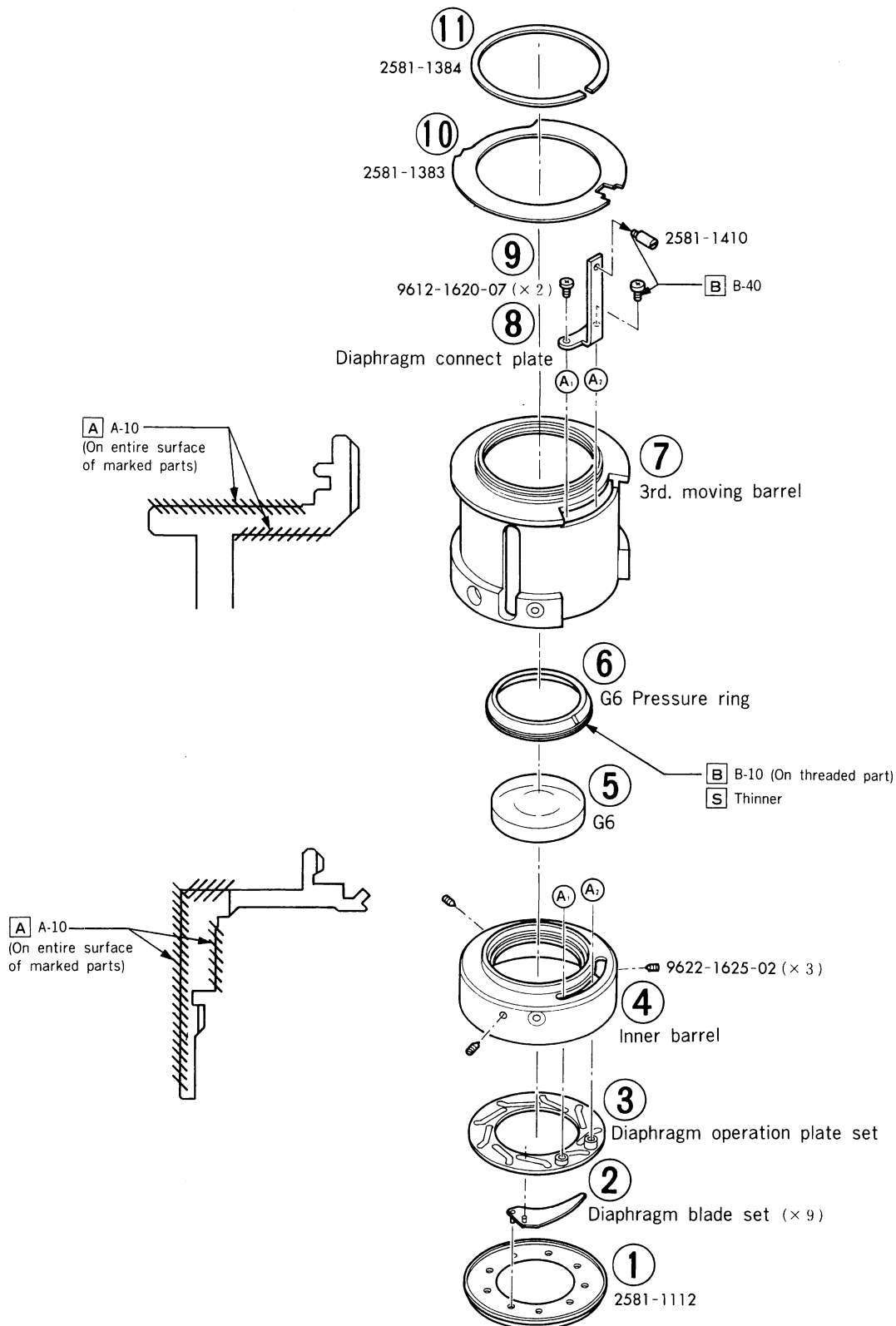
■ Precautions

- Since this lens uses many resin parts, keep the following in mind when assembling and adjusting.
 - Use Fronsolve or alcohol when cleaning.
 - Never use thinner, ketone or ether.
- Since this lens uses MOS-IC, it is necessary to take special precautions about static electricity. When performing repair, use the conductive mat as shown.



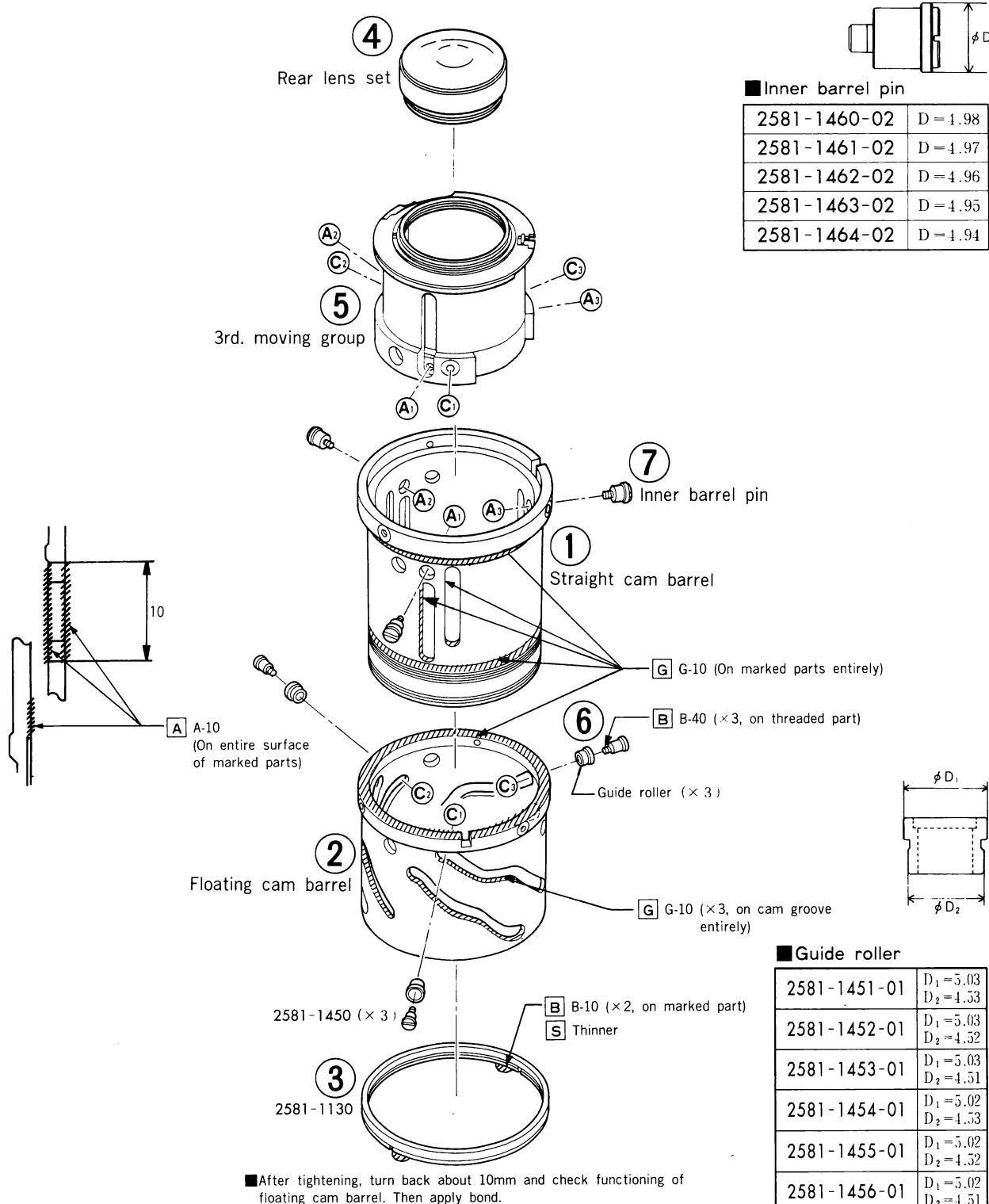
1 Diaphragm blades, Inner barrel, 3rd moving barrel

■ Assemble the parts in order of ①-⑪.



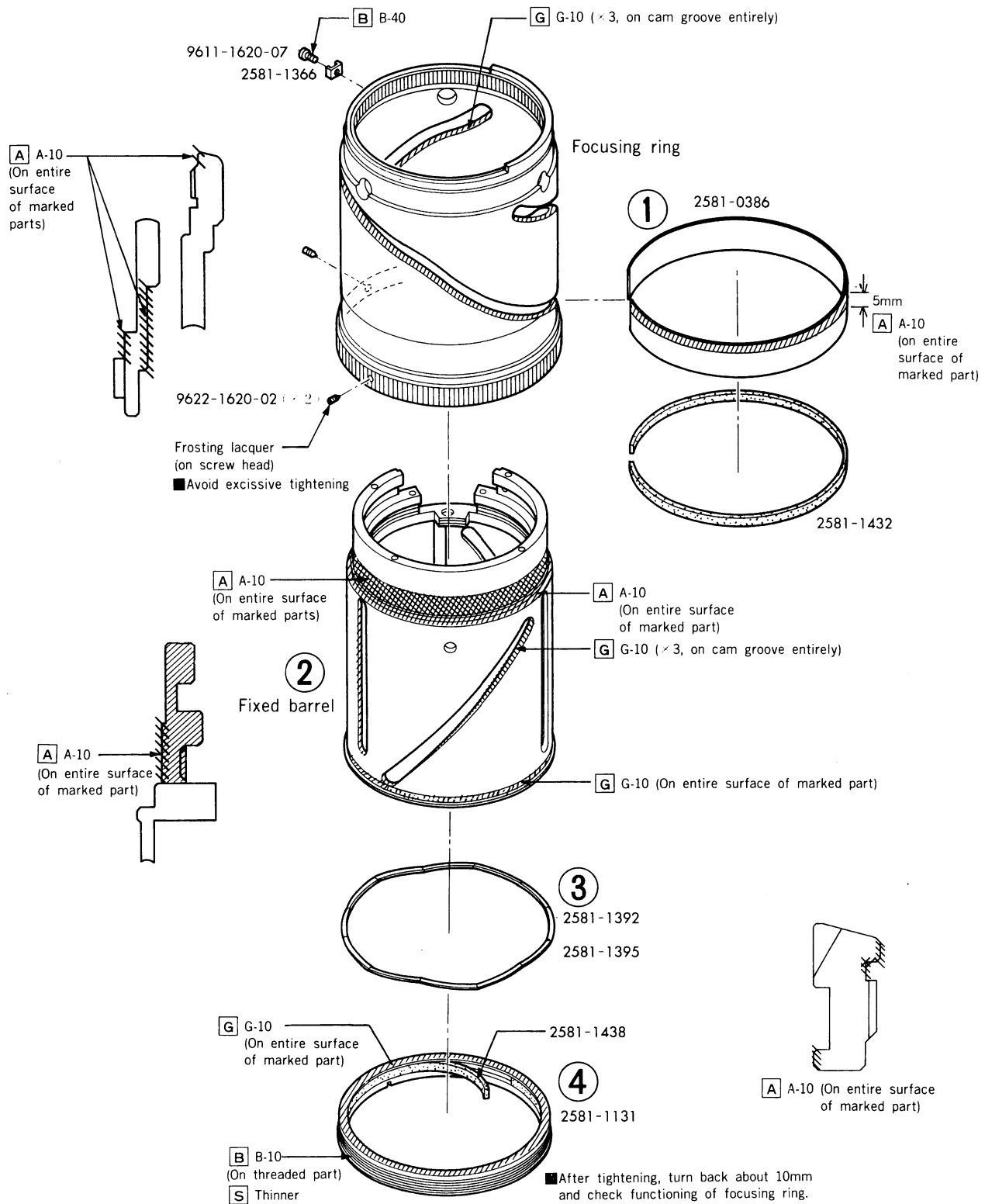
2 Floating cam barrel, Straight cam barrel, Rear lens set

■ Assemble the parts in order of ①-⑦.



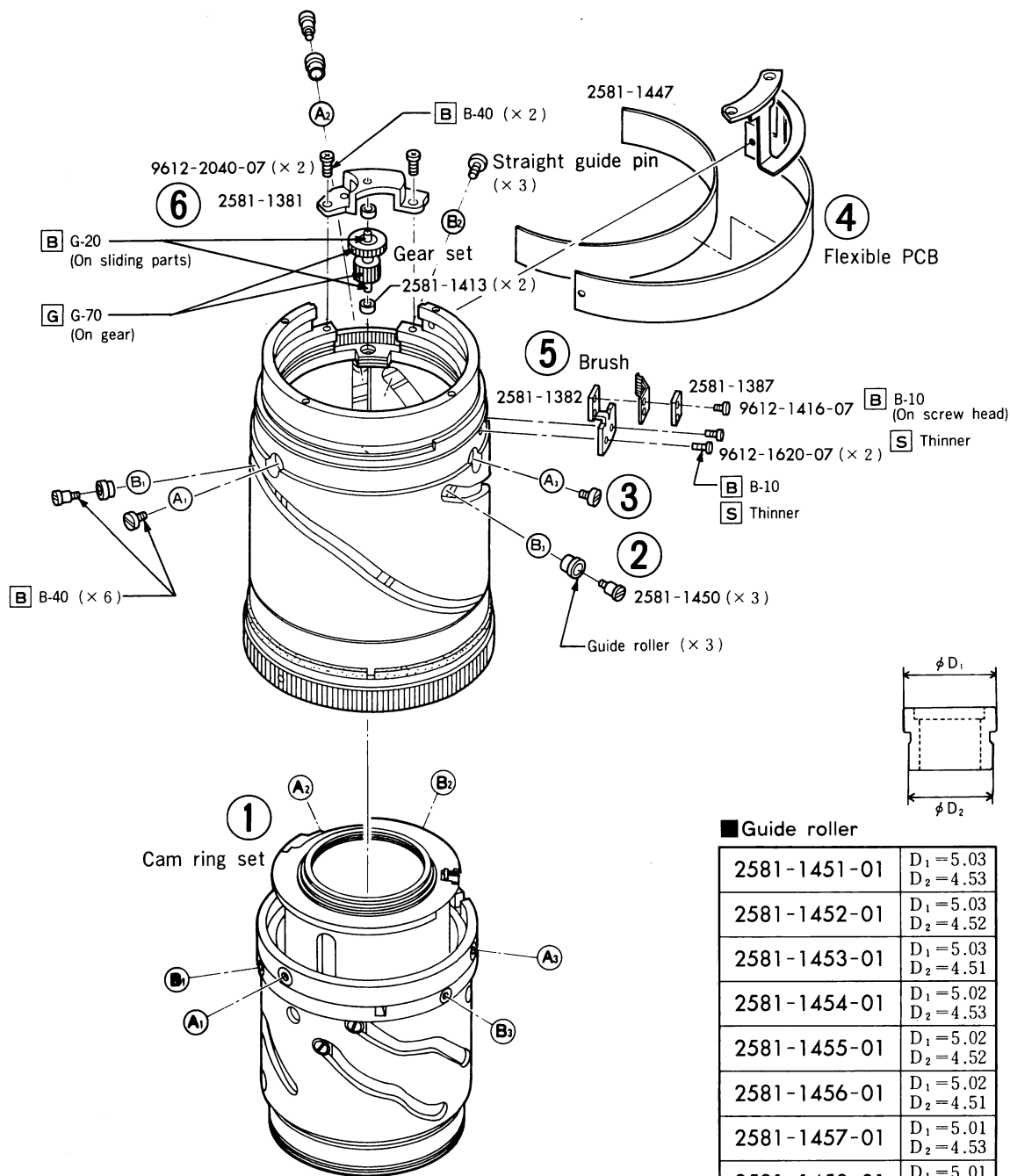
3 Fixed barrel, Focusing ring

■ Assemble the parts in order of ①-④.



4 Flexible PC board, Gear set

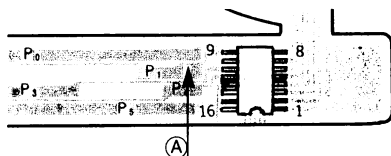
■ Assemble the parts in order of ①-⑥



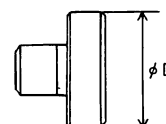
■ Guide roller

2581-1451-01	D ₁ =5.03 D ₂ =4.53
2581-1452-01	D ₁ =5.03 D ₂ =4.52
2581-1453-01	D ₁ =5.03 D ₂ =4.51
2581-1454-01	D ₁ =5.02 D ₂ =4.53
2581-1455-01	D ₁ =5.02 D ₂ =4.52
2581-1456-01	D ₁ =5.02 D ₂ =4.51
2581-1457-01	D ₁ =5.01 D ₂ =4.53
2581-1458-01	D ₁ =5.01 D ₂ =4.52
2581-1459-01	D ₁ =5.01 D ₂ =4.51

■ Brush positioning



- Set focusing-ring to ∞ (shortest lens's length), then align the tip of brush with line A on flexible PCB.



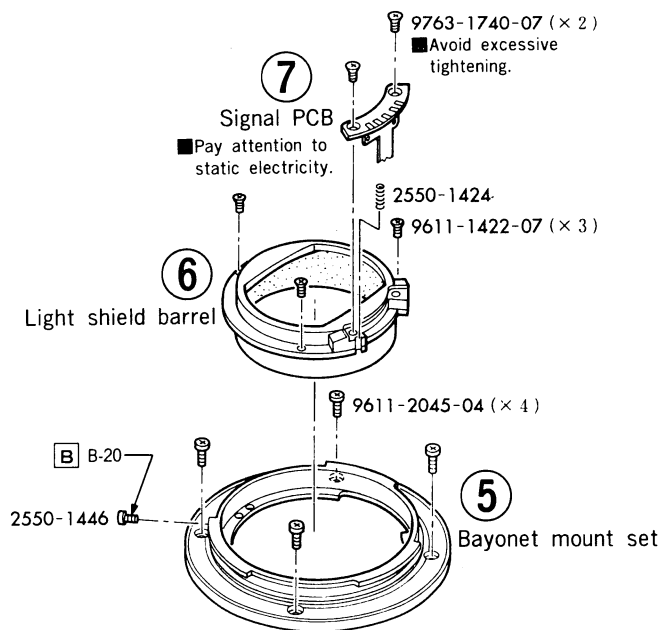
■ Straight guide pin

2581-1465-01	D=4.52
2581-1466-01	D=4.51
2581-1467-01	D=4.50

5 Temporary assembly for aperture diameter adjusting, Outer ring set

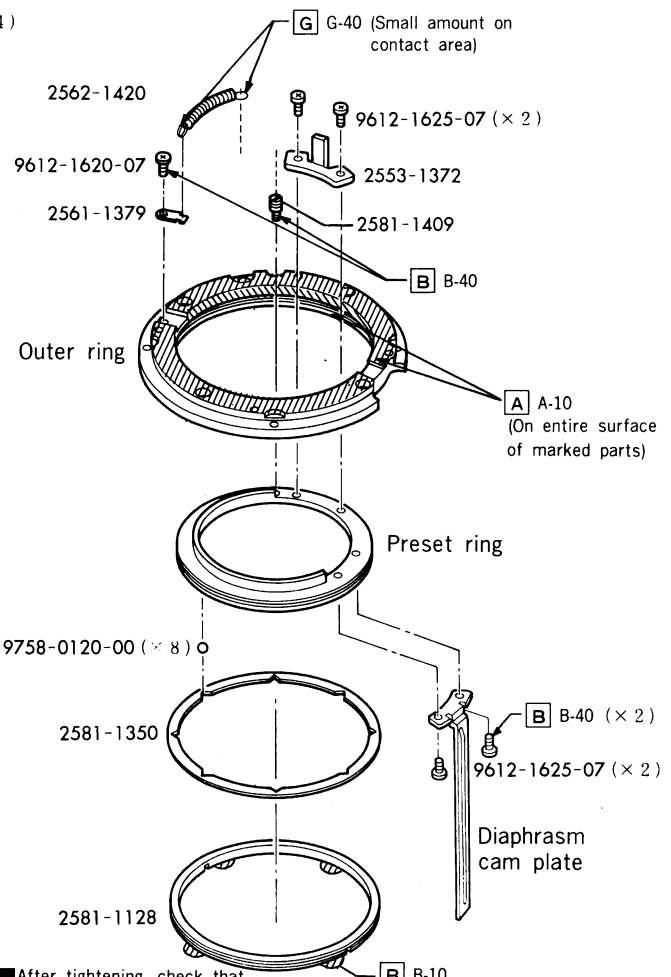
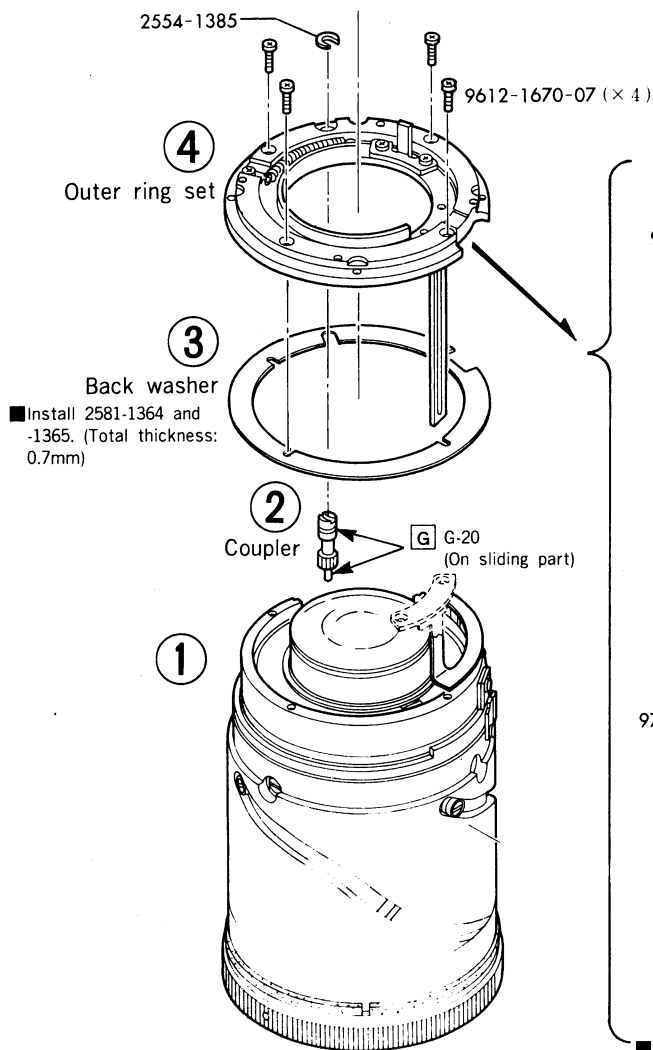
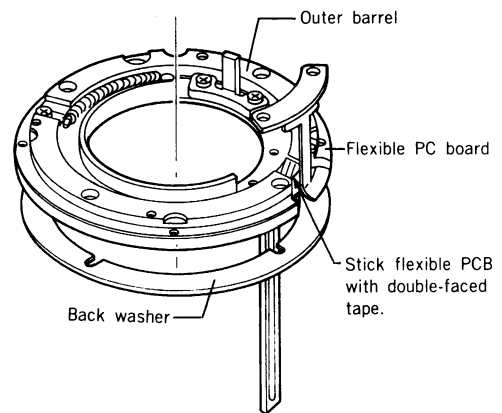
■ Assemble the parts in order of ①-⑦.

■ After assembling, perform "Aperture diameter adjusting" and "Aperture diameter pre-checking" following General checking/adjusting procedure p. 8-11.



■ Flexible PC board arranging

- Arrange flexible PC board properly between outer barrel and back washer as shown. Then, tighten 9612-1670-07 (× 4).

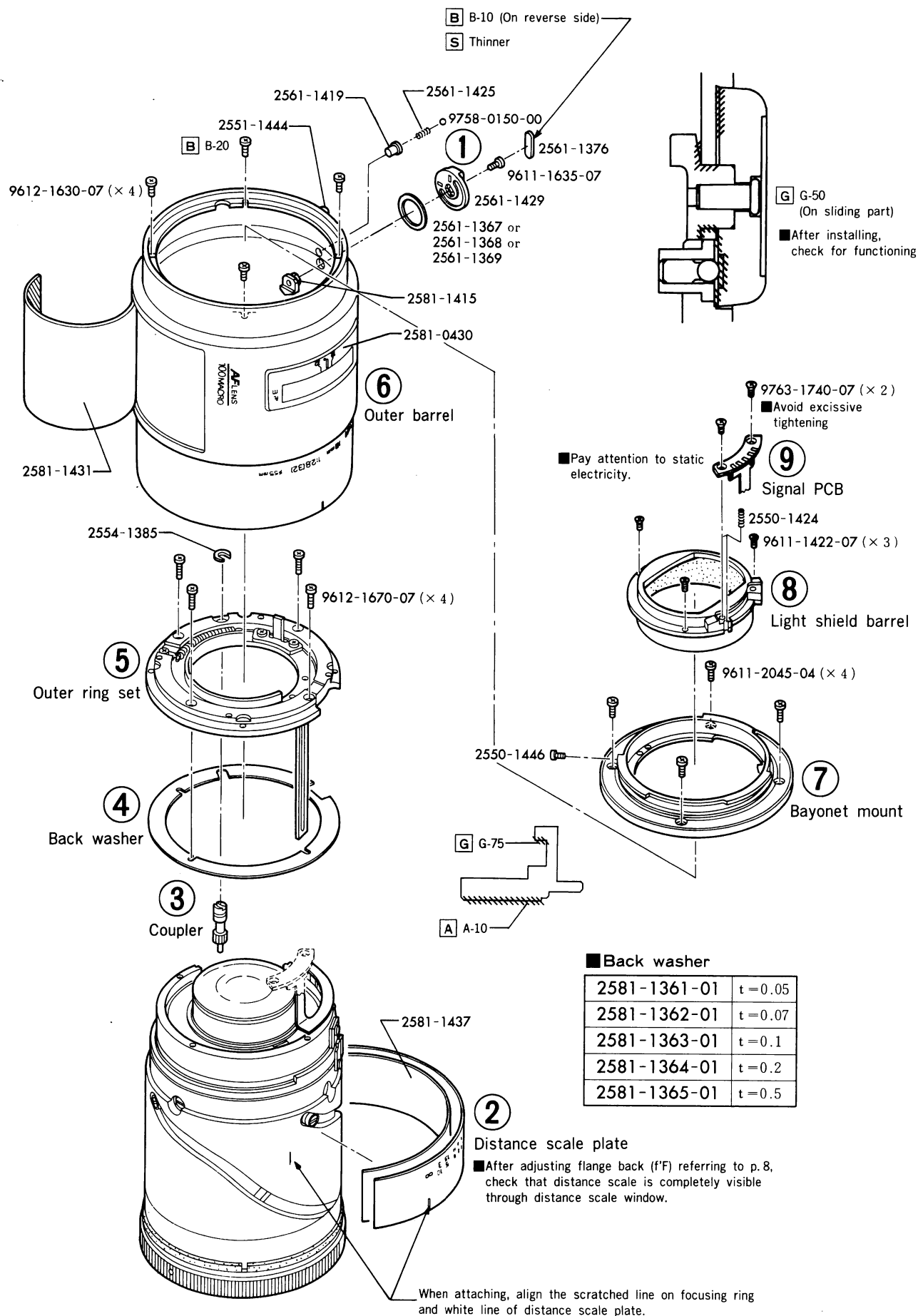


■ After tightening, check that preset ring functions smoothly without looseness. Then, apply bond.

B B-10
S Thinner

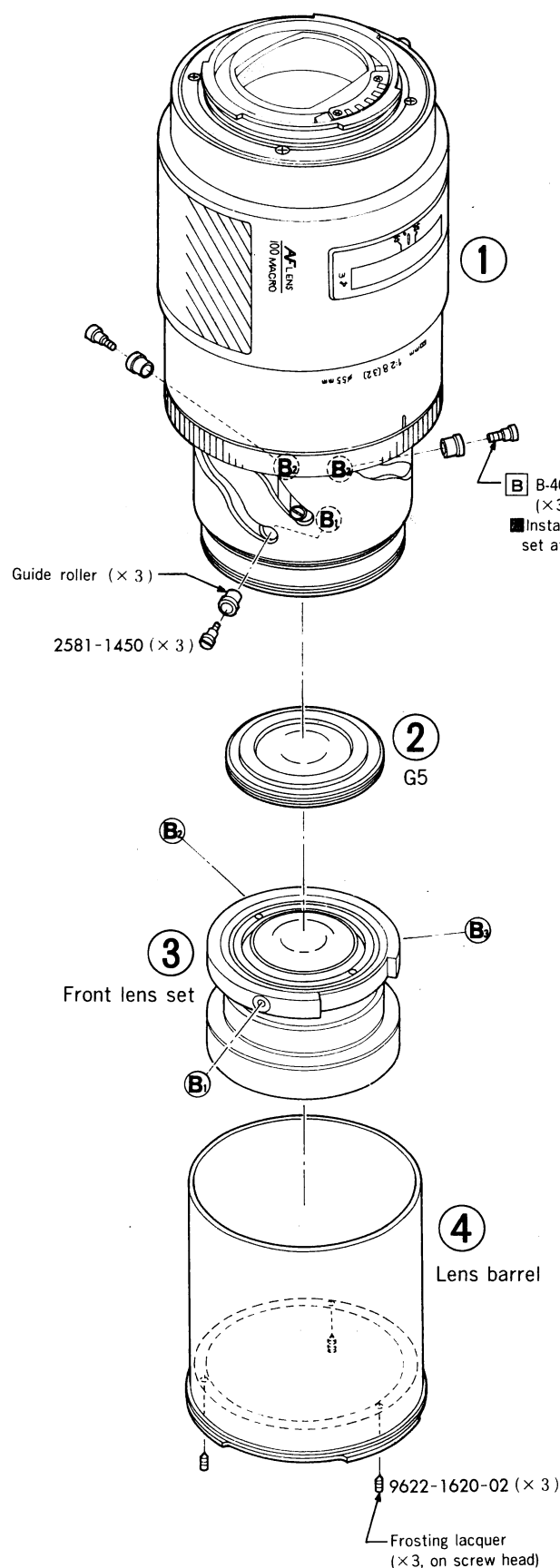
6 Outer barrel, Bayonet mount, Light shield barrel

■ Assemble the parts in order of ①-⑨.



7 Front lens set, Lens barrel

■ Assemble the parts in order of ①-④. After assembling, perform the following checking and adjusting.



1. Adjust flange back. (See p. 8)

Allowable range ($f'F$) = $44.57^{+0.03}_0$

2. Check projection resolving power.

(See General checking/adjusting procedure p. 6.)

Allowable range for Servicing (min.)

f (mm)	Distance D (m)	Center ($y' = 0$)	$y' = 15$	
			S	M
100	2.5-4.2	100	40	40

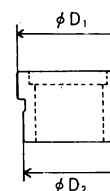
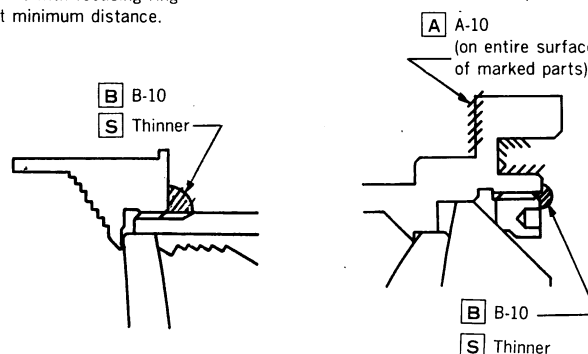
S : Sagittal image M : Meridional image

3. Check aperture diameter.

(See General checking/adjusting procedure p. 9.)

4. Check general function.

(See General checking/adjusting procedure p. 14.)



■ Guide roller

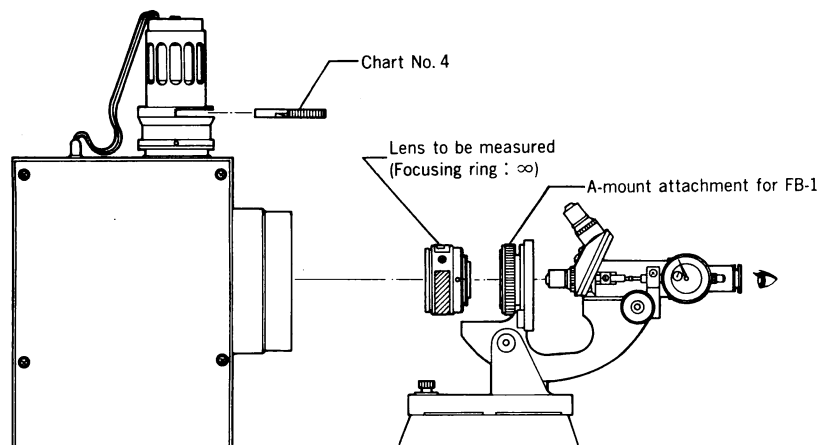
2581-1451-01	D ₁ = 5.03 D ₂ = 4.53
2581-1452-01	D ₁ = 5.03 D ₂ = 4.52
2581-1453-01	D ₁ = 5.03 D ₂ = 4.51
2581-1454-01	D ₁ = 5.02 D ₂ = 4.53
2581-1455-01	D ₁ = 5.02 D ₂ = 4.52
2581-1456-01	D ₁ = 5.02 D ₂ = 4.51
2581-1457-01	D ₁ = 5.01 D ₂ = 4.53
2581-1458-01	D ₁ = 5.01 D ₂ = 4.52
2581-1459-01	D ₁ = 5.01 D ₂ = 4.51

■ Flange back adjusting

- Measuring instruments : Collimator (Model RC-1000 I*, II*, III) ※Discontinued model
: Flange back checking tester (FB-1)
: A-mount attachment for FB-1
: Flange back gauge (43.50mm)

■ Preparation

- Set lens and measuring instruments as Fig. below.



■ Adjusting procedure

(For preparation of measuring instruments and measurement of flange back, see "Flange back (f' F) measuring, adjusting procedure" of General checking/adjusting procedure on p. 1.)

1. Check if flange back value meets allowable range ($44.57^{+0.03}_0$).

If out of allowable range, calculate correct value.

(Example) Measured flange back value : 44.50

Allowable range : 44.57—44.60

$44.57 - 44.50 = 0.07$ } Decrease back washer thickness (0.07—0.10mm)

$44.60 - 44.50 = 0.10$ } to meet allowable range.

- If measured flange back value is shorter than allowable range...decrease back washer thickness
 - If measured flange back value is longer than allowable range...increase back washer thickness
2. Remove back washer from lens unit.
 3. Measure thickness of original back washer. Then select proper total thickness of back washer.
(Classified back washers are given on p. 6.)
 4. After assembling, make sure that flange back meets allowable range.
(If out of allowable range, repeat above procedures 1-3.)

Flexible PC board replacing procedure

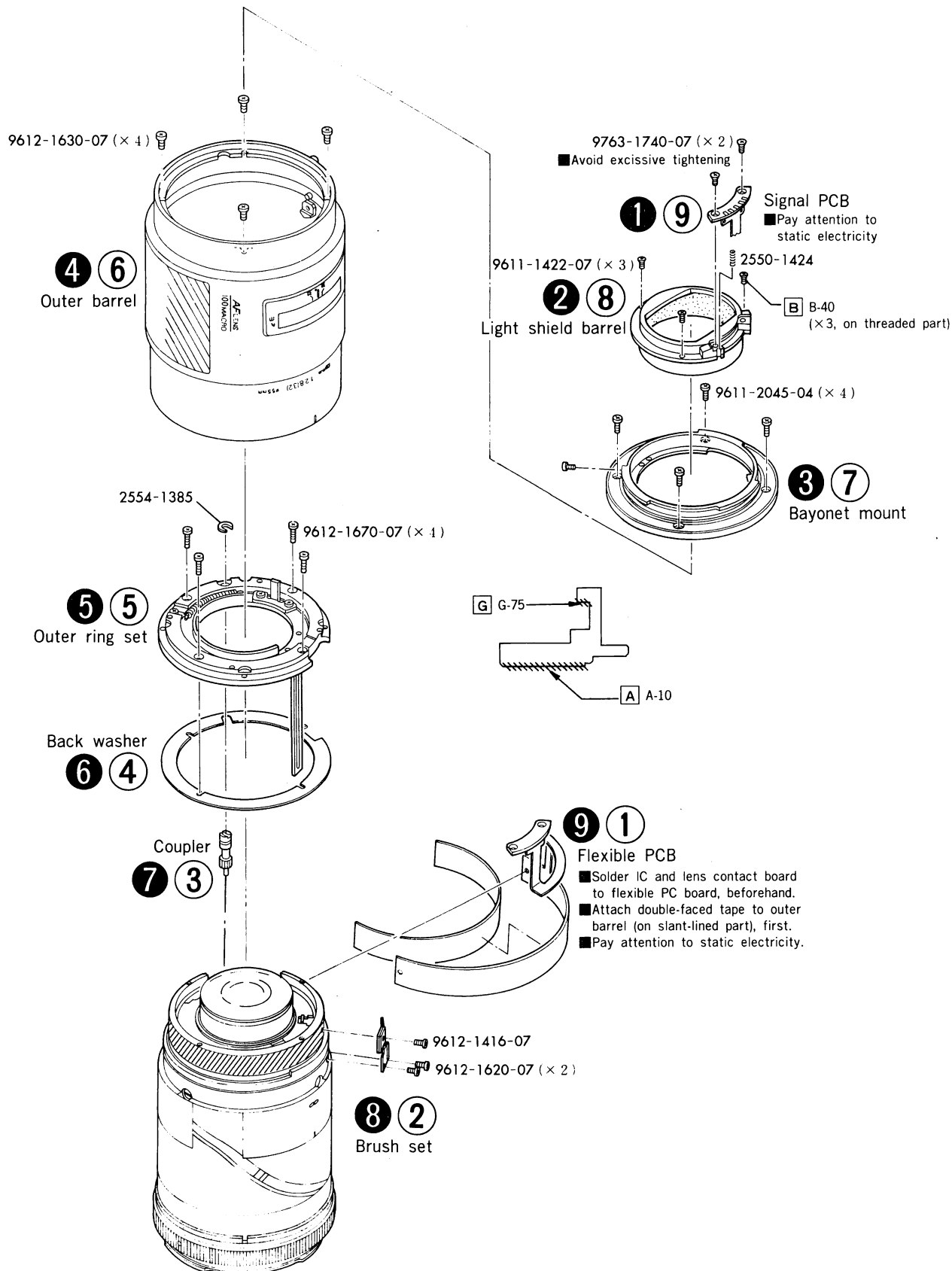
■ Disassemble the parts in order of ①-⑨.

■ Assemble the parts in order of ①-⑨.

■ After assembling, check general function. (See General checking/adjusting procedure p. 14.)

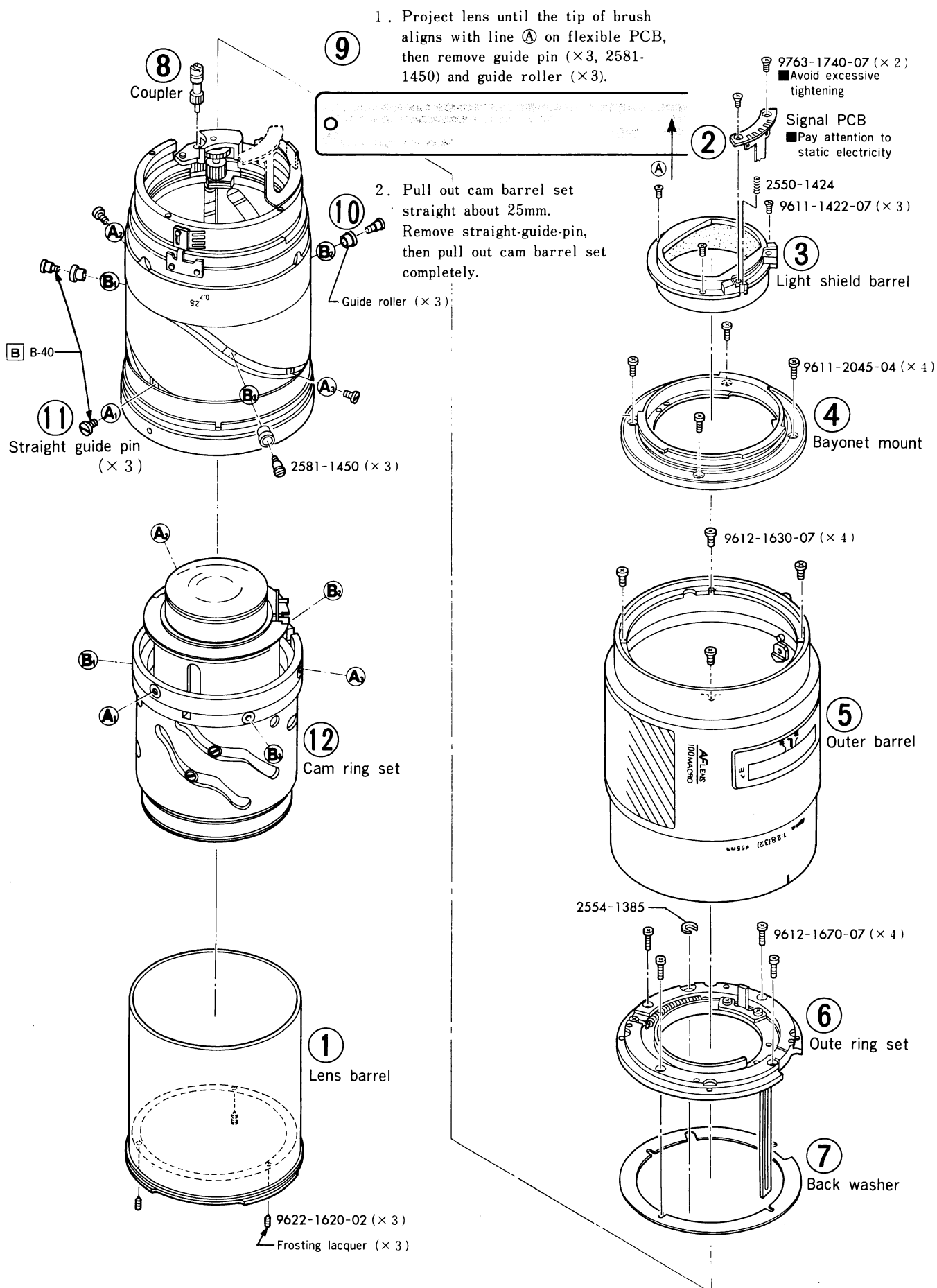
■ When installing flexible PC board, be careful with the followings:

- (1) Do not allow air between flexible PC board and double-faced tape.
- (2) Do not install flexible PC board slanted.



Disassembling procedure to block unit

■ Here is the order to disassemble for your convenience, follow the reverse procedure when assembling.



Part No.	Part Name		Qty.
2550-1424-01	Spring	アース S P	1
2561-1425-01	Click spring	フォーカスクリック S P	1
2561-1429-01	Focus range limiter	フォーカス範囲切換ノブ	1
2581-1431-01	Leather	貼皮	1
2581-1437-01	Tape	テープ	1
2551-1444-01	Bayonet point	バヨネット標点	1
2581-1630-01	Outer barrel (for MAXXUM)	固定保持環	1
9611-1422-07	Phillips type screw	十字穴付なべ小ねじ	3
9611-1635-07	Phillips type screw	十字穴付なべ小ねじ	1
9611-2045-04	Phillips type screw	十字穴付なべ小ねじ	4
9612-1620-07	Phillips type screw	十字穴付なべ小ねじ	1
9612-1625-07	Phillips type screw	十字穴付なべ小ねじ	4
9612-1630-07	Phillips type screw	十字穴付なべ小ねじ	4
9612-1670-07	Phillips type screw	十字穴付なべ小ねじ	4
9612-2040-07	Phillips type screw	十字穴付なべ小ねじ	2
9758-0120-00	Steel ball	スチールボール	8
9758-0150-00	Steel ball	スチールボール	1
9763-1740-07	Tap tite screw	十字穴付タップタイトねじ	2

■ Adjusting procedure

1. Minute adjusting (fig. 1 ㉔)

- ① Remove rubber ring from lens to be measured.
- ② Loosen screws (2550-1445-01, ×5).....fig. 1 ㉔
- ③ Set the lens to flange-back-checking-tester (FB-1).
- ④ Set focal length to f=200mm, by rotating zoom ring.
- ⑤ Set dial gauge of flange-back-checking tester to 44.63mm (center of allowable range).
- ⑥ Keeping focusing ring at infinity, rotate outer ring to either right or left to focus, then tape them temporarily.....fig. 3
- ⑦ Temporarily tighten the screws...fig. 1 ㉔
- ⑧ Set focal length to f=100mm and 150mm, then focus. Measure flange back at each focal length (100mm and 150mm).
- ⑨ Make sure that flange back meets allowable range (fig. 4), tighten up screws, then re-measure each flange back value.

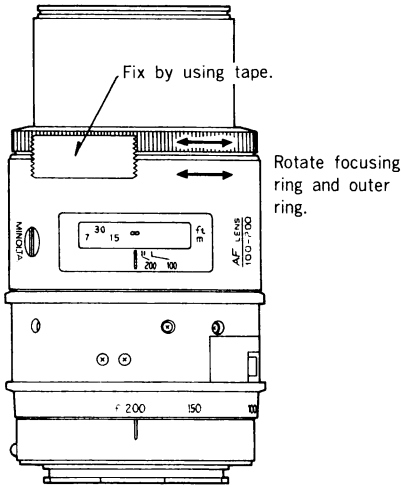
Adjusting completes with flange back meeting allowable range.

- If flange back values do not meet allowable range at 100mm or 150mm focal length, re-set flange back of focal length f=200mm within allowable range: ⑤ Set dial gauge of flange-back-checking-tester to 44.67mm or 44.59mm.

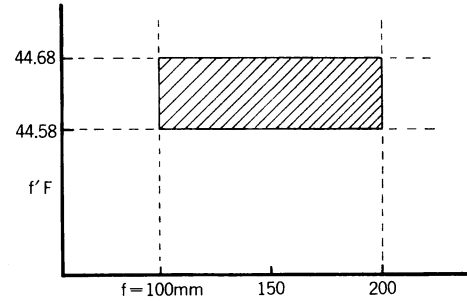
Then, repeat above procedures from ⑥.

- If flange back is not adjustable by above procedures, perform "2. Rough adjusting" on p. 9.

■ Fig. 3 Minute adjusting



■ Fig. 4 Allowable range of focus shift/flange back



[Cautions]

1. After adjusting completion, make sure that distance index (fig. 2) is within ±1.5mm from infinity setting position. If not, perform "2. Rough adjusting" on p. 9.
2. If all parts are not assembled correctly, such as incorrect helicoid interlocking position, distance index may be out of range, or adjusting may not be performed.

■ Focus shift/flange back (f'F) adjustments

- General "Focus shift/flange back adjusting procedure for zoom lens" is not suitable for thin lens (focus shift and flange back cannot be adjusted correctly) so that adjust focus shift/flange back as follows.
- For focus shift/flange back measuring procedure, see "General checking/adjusting procedures p. 3-5.)

■ Measuring instruments :

- : Collimator (Model RC-1000 I*, II*, III) ※Discontinued model
- For the lens whose focal length is 300mm or more, longer collimator (f=1500mm or more) is needed.
- : Flange back checking tester (FB-1)
- : A-mount attachment for FB-1
- : Flange back gauge (43.50mm)

■ Adjusting points

There are 3 points for adjusting (rough or minute). (See fig. 1.)

1. Minute adjusting (fig. 1 ㉔).....See p. 8 for details.
 - By changing outer-ring installing position, distance index (see fig. 2) shifts. (This adjusting is used for general minute adjusting or after repairing without replacing parts especially optical elements.)
 - For almost cases, this adjusting may be sufficient.
2. Rough adjusting (fig. 1 ㉕, ㉖).....See p. 9 for details.
 - Required when minute adjusting is impossible.
 - Performed by changing total thickness of washers.

[Cautions]

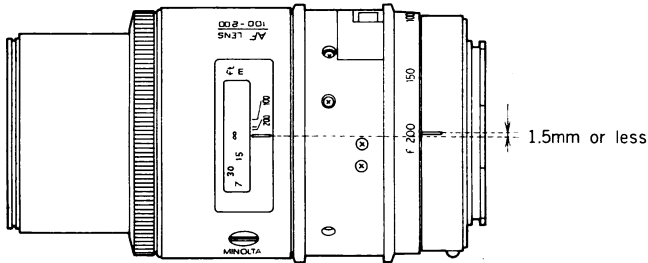
- Both focus shift and flange back will change with adjusting ㉔, ㉕, or ㉖.
- Adjustings may not be performed if all parts are not assembled correctly, such as incorrect helicoid position.

■ Table-1

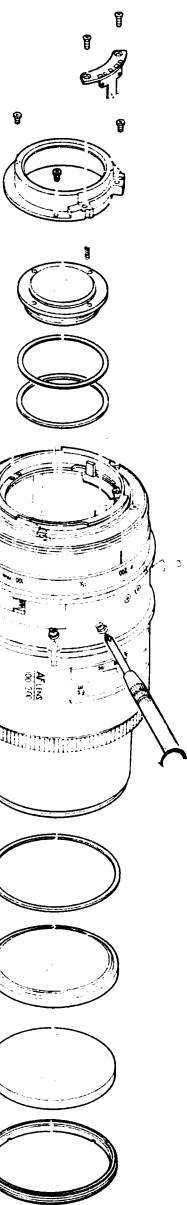
Thickness of back washer

A	2560-1385	0.05 (mm)
B	2560-1386	0.08
C	2560-1387	0.1
D	2560-1388	0.2
E	2560-1389	0.5
F	2560-1390	0.7

■ Fig. 2 Position of distance index



■ Fig. 1



㉕ Back washer

- Total thickness of back washers should be 1.4mm or less. (See table 1.)

㉔ Screws (× 5)

- By changing focus stopper (2560-1383-01) and/or screws (2550-1445-01, × 5), infinity setting position shifts.
- Infinity setting position should be within 1.5mm from distance index setting (fig. 2).

㉖ Adjusting washer

- Use 0-2 washers which thickness is 0.4mm.

■ Table 2 Thickness of washers to be added or removed when adjusting 2560 focus shift/flange back (f'F)

<div>f'F(f=100)</div> <div>f'F(f=200)</div>	45.00	44.95	44.90	44.85	44.80	44.75	44.70	44.65	44.60	44.55	44.50	44.45	44.40	44.35	44.30	44.25	44.20
45.50	B= .07 C= .23	.2 .15	.32 .08	.44 0	.56 -.08	.69 -.15	.81 -.23	.93 -.3	1.06 -.38	1.18 -.46	1.3 -.53	1.42 -.61	1.55 -.69	1.67 -.76	1.79 -.84	1.91 -.92	2.04 -.99
45.45	B= .02 C= .25	.14 .18	.26 .1	.38 .02	.51 -.05	.63 -.13	.75 -.21	.87 -.28	1 -.36	1.12 -.44	1.24 -.51	1.37 -.59	1.49 -.67	1.61 -.74	1.73 -.82	1.86 -.9	1.98 -.97
45.40	B= -.04 C= .27	.08 .2	.2 .12	.32 .04	.45 -.03	.57 -.11	.69 -.19	.82 -.26	.94 -.34	1.06 -.42	1.18 -.49	1.31 -.57	1.43 -.64	1.55 -.72	1.67 -.8	1.8 -.87	1.92 -.95
45.35	B= -.1 C= .29	.02 .22	.14 .14	.27 .06	.39 -.01	.51 -.09	.63 -.16	.76 -.24	.88 -.32	1 -.39	1.13 -.47	1.25 -.55	1.37 -.62	1.49 -.7	1.62 -.78	1.74 -.85	1.86 -.93
45.30	B= -.16 C= .32	-.04 .24	.08 .16	.21 .09	.33 .01	.45 -.07	.58 -.14	.7 -.22	.82 -.3	.94 -.37	1.07 -.45	1.19 -.53	1.31 -.6	1.43 -.68	1.56 -.76	1.68 -.83	1.8 -.91
45.25	B= -.22 C= .34	-.1 .26	.03 .18	.15 .11	.27 .03	.39 -.05	.52 -.12	.64 -.2	.76 -.28	.89 -.35	1.01 -.43	1.13 -.5	1.25 -.58	1.38 -.66	1.5 -.73	1.62 -.81	1.74 -.89
45.20	B= -.28 C= .36	-.16 .28	-.03 .2	.09 .13	.21 .05	.34 -.02	.46 -.1	.58 -.18	.7 -.25	.83 -.33	.95 -.41	1.07 -.48	1.19 -.56	1.32 -.64	1.44 -.71	1.56 -.79	1.69 -.87
45.15	B= -.34 C= .38	-.21 .3	-.09 .23	.03 .15	.15 .07	.28 0	.4 -.08	.52 -.16	.65 -.23	.77 -.31	.89 -.39	1.01 -.46	1.14 -.54	1.26 -.62	1.38 -.69	1.5 -.77	1.63 -.84
45.10	B= -.4 C= .4	-.27 .32	-.15 .25	-.03 .17	.1 .09	.22 .02	.34 -.06	.46 -.14	.59 -.21	.71 -.29	.83 -.36	.95 -.44	1.08 -.52	1.2 -.59	1.32 -.67	1.45 -.75	1.57 -.84
45.05	B= -.45 C= .42	-.33 .34	-.21 .27	-.09 .19	.04 .12	.16 .04	.28 -.04	.41 -.11	.53 -.19	.65 -.27	.77 -.34	.9 -.42	1.02 -.5	1.14 -.57	1.26 -.65	1.39 -.73	1.51 -.8
45.00	B= -.51 C= .44	-.39 .37	-.27 .29	-.14 .21	-.02 .14	.1 .06	.22 -.02	.35 -.09	.47 .17	.59 -.25	.71 -.32	.84 -.4	.96 -.48	1.08 -.55	1.21 -.63	1.33 -.7	1.45 -.78
44.95	B= -.57 C= .46	-.45 .39	-.33 .31	-.2 .23	-.08 .16	.04 .08	.17 0	.29 -.07	.41 -.15	.53 -.22	.66 -.3	.78 -.38	.9 -.45	1.02 -.53	1.15 -.61	1.27 -.68	1.39 -.76
44.90	B= -.63 C= .48	-.51 .41	-.38 .33	-.26 .26	-.14 .18	-.02 .1	.11 .03	.23 -.05	.35 -.13	.47 -.2	.6 -.28	.72 -.36	.84 -.43	.97 -.51	1.09 -.59	1.21 -.66	1.33 -.74
44.85	B= -.69 C= .51	-.57 .43	-.44 .35	-.32 .28	-.2 .2	-.07 .12	.05 -.03	.17 -.05	.29 -.11	.42 -.18	.54 -.26	.66 -.34	.78 -.41	.91 -.49	1.03 -.56	1.15 -.64	1.27 -.72
44.80	B= -.75 C= .53	-.62 .45	-.5 .37	-.38 .3	-.26 .22	-.13 .14	-.01 .07	.11 -.01	.23 -.08	.36 -.16	.48 -.24	.6 -.31	.73 -.39	.85 -.47	.97 -.54	1.09 -.62	1.22 -.7
44.75	B= -.81 C= .55	-.68 .47	-.56 .4	-.44 .32	-.31 .24	-.19 .17	-.07 .09	.05 .01	.18 -.06	.3 -.14	.42 -.22	.54 -.29	.67 -.37	.79 -.45	.91 -.52	1.03 -.6	1.16 -.68
44.70	B= -.86 C= .57	-.74 .49	-.62 .42	-.5 .34	-.37 .26	-.25 .19	-.13 .11	-.01 .03	.12 -.04	.24 -.12	.36 -.2	.49 -.27	.61 -.35	.73 -.42	.85 -.5	.98 -.58	1.1 -.65
44.65	B= -.92 C= .59	-.8 .51	-.68 .44	-.55 .36	-.43 .28	-.31 .21	-.19 .13	-.06 .06	.06 -.02	.18 -.1	.3 -.17	.43 -.25	.55 -.33	.67 -.4	.79 -.48	.92 -.56	1.04 -.63
44.60	B= -.98 C= .61	-.86 .54	-.74 .46	-.61 .38	-.49 .31	-.37 .23	-.25 .15	-.12 .08	0 0	.12 -.08	.25 -.15	.37 -.23	.49 -.31	.61 -.38	.74 -.46	.86 -.54	.98 -.61
44.55	B= -1.04 C= .63	-.92 .56	-.79 .48	-.67 .4	-.55 .33	-.43 .25	-.3 .17	-.18 .1	-.06 .02	.06 -.13	.19 -.21	.31 -.28	.43 -.36	.55 -.44	.68 -.51	.8 -.59	.92 -.68
44.50	B= -1.1 C= .65	-.98 .58	-.85 .5	-.73 .42	-.61 .35	-.49 .27	-.36 .2	-.24 .12	-.12 .04	.01 -.03	.13 -.11	.25 -.19	.37 -.26	.5 -.34	.62 -.42	.74 -.49	.86 -.57
44.45	B= -1.16 C= .68	-1.03 .6	-.91 .52	-.79 .45	-.67 .37	-.54 .29	-.42 .22	-.3 .14	-.18 .06	-.05 -.01	.07 -.09	.19 -.17	.31 -.24	.44 -.32	.56 -.4	.68 -.47	.81 -.55
44.40	B= -1.22 C= .7	-1.09 .62	-.97 .54	-.85 .47	-.73 .39	-.6 .31	-.48 .24	-.36 .16	-.23 .08	-.11 .01	.01 -.07	.13 -.14	.26 -.22	.38 -.3	.5 -.37	.62 -.45	.75 -.53
44.35	B= -1.27 C= .72	-1.15 .64	-1.03 .56	-.91 .49	-.78 .41	-.66 .34	-.54 .26	-.42 .18	-.29 .11	-.17 .03	.05 -.05	.07 -.12	.2 -.2	.32 -.28	.44 -.35	.57 -.43	.69 -.51
44.30	B= -1.33 C= .74	-1.21 .66	-1.09 .59	-.97 .51	-.84 .43	-.72 .36	-.6 .28	-.47 .2	-.35 .13	-.23 .05	-.11 -.03	.02 -.1	.14 -.18	.26 -.26	.38 -.33	.51 -.41	.63 -.48
44.25	B= -1.39 C= .76	-1.27 .68	-1.15 .61	-1.02 .53	-.9 .45	-.78 .38	-.66 .3	-.53 .22	-.41 .15	-.29 .07	-.17 0	-.04 -.08	.08 -.16	.2 -.23	.33 -.31	.45 -.39	.57 -.46
44.20	B= -1.45 C= .78	-1.33 .7	-1.21 .63	-1.08 .55	-.96 .48	-.84 .4	-.71 .32	-.59 .25	-.47 .17	-.35 .09	-.22 .02	-.1 -.06	.02 -.14	.14 -.21	.27 -.29	.39 -.37	.51 -.44
44.15	B= -1.51 C= .8	-1.39 .73	-1.26 .65	-1.14 .57	-1.02 .5	-.9 .42	-.77 .34	-.65 .27	-.53 .19	-.41 .11	-.28 .04	-.16 -.12	-.04 -.19	.09 -.27	.21 -.34	.33 -.42	.45 -.51
44.10	B= -1.57 C= .82	-1.45 .75	-1.32 .67	-1.2 .59	-1.08 .52	-.95 .44	-.83 .36	-.71 .29	-.59 .21	-.46 .14	-.34 .06	-.22 -.02	-.1 -.09	.03 -.17	.15 -.25	.27 -.32	.4 -.4
44.05	B= -1.63 C= .84	-1.5 .77	-1.38 .69	-1.26 .62	-1.14 .54	-1.01 .46	-.89 .39	-.77 .31	-.65 .23	-.52 .16	-.4 .08	-.28 -.07	-.15 -.15	-.03 -.13	.09 -.23	.21 -.3	.34 -.38
44.00	B= -1.69 C= .87	-1.56 .79	-1.44 .71	-1.32 .64	-1.19 .56	-1.07 .48	-.95 .41	-.83 .33	-.7 .25	-.58 .18	-.46 .1	-.34 .02	-.21 -.05	-.09 -.13	.03 -.2	.16 -.28	.28 -.36
43.95	B= -1.74 C= .89	-1.62 .81	-1.5 .73	-1.38 .66	-1.25 .58	-1.13 .5	-.101 .43	-.89 .35	-.76 .28	-.64 .2	-.52 .12	-.39 .05	-.27 -.03	-.15 -.11	-.03 -.18	.1 -.26	.22 -.34
43.90	B= -1.8 C= .91	-1.68 .83	-1.56 .76	-1.43 .68	-1.31 .6	-1.19 .53	-.107 .45	-.94 .37	-.82 .3	-.7 .22	-.58 .14	-.45 .07	-.33 -.01	-.21 -.09	-.08 -.16	.04 -.24	.16 -.32
43.85	B= -1.86 C= .93	-1.74 .85	-1.62 .78	-1.49 .7	-1.37 .62	-1.25 .55	-.113 .47	-.98 .39	-.86 .32	-.76 .24	-.63 .16	-.51 .09	-.39 .01	-.27 -.06	-.14 -.14	-.02 -.22	.1 -.29
43.80	B= -1.92 C= .95	-1.8 .87	-1.67 .8	-1.55 .72	-1.43 .64	-1.31 .57	-1.18 .49	-1.06 .42	-.94 .34	-.82 .26	-.69 .19	-.57 .11	-.45 .03	-.32 -.04	-.2 -.12	-.08 -.2	.04 -.27
43.75	B= -1.98 C= .97	-1.86 .9	-1.73 .82	-1.61 .74	-1.49 .67	-1.37 .59	-1.24 .51	-1.12 .44	-.9 .36	-.87 .28	-.75 .21	-.63 .05	-.51 -.02	-.38 -.1	-.26 -.1	-.14 -.18	-.02 -.25
43.70	B= -2.04 C= .99	-1.91 .92	-1.79 .84	-1.67 .76	-1.55 .69	-1.42 .61	-1.3 .53	-1.18 .46	-1.06 .38	-.93 .3	-.81 .23	-.69 .15	-.56 .08	-.44 0	-.32 -.08	-.2 -.15	-.07 -.23

2. Rough adjusting

Performed by changing thickness of washers (Ⓑ, Ⓒ of fig.1, p.8). Required when “1. Minute adjusting” is not possible, or when distance index is out of range.

① Set the lens to be measured as follows:

- Remove rubber ring.
- Set the thickness of washers (Ⓑ, Ⓒ) to original one, or B=0.4mm (1 piece), C=0.7mm.

② Align distance index and infinity setting position.

- Loosen screws (×5) of fig.1 Ⓐ, rotate outer ring in order to align distance index and infinity setting position as fig.2 on p.8. Then, tighten up the screws.

③ Measure flange back values at focal length f=200mm and 100mm by flange-back-checking-tester.

④ Find the thickness of adjusting washer Ⓑ, and back washer Ⓒ from Table 2, according to the flange back values.

[Example]

When the above flange back values are the followings:

With f=200mm.....f'F=45.12mm

With f=100mm.....f'F=44.68mm

- Read the nearest values of f'F on Table 2, then select the thickness of washers Ⓑ and Ⓒ.

A part of Table 2

(mm)

<div>f'F(f=100)</div> <div>f'F(f=200)</div>	45.00	44.95	44.90	44.85	44.80	44.75	44.70	44.65
45.50	B= .07 C= .23	.2 .15	.32 .08	.44 0	.56 -.08	.69 -.15	.81 -.23	.93 -.3
45.45	B= .02 C= .25	.14 .18	.26 .1	.38 .02	.51 -.05	.63 -.13	.75 -.21	.87 -.28
45.40	B= -.04 C= .27	.08 .2	.2 .12	.32 .04	.45 -.03	.57 -.11	.69 -.19	.82 -.26
45.35	B= -.1 C= .29	.02 .22	.14 .14	.27 .06	.39 -.01	.51 -.09	.63 -.16	.76 -.24
45.30	B= -.16 C= .32	-.04 .24	.08 .16	.21 .09	.33 .01	.45 -.07	.58 -.14	.7 -.22
43.25	B= -.22 C= .34	-.1 .26	.03 .18	.15 .11	.27 .03	.39 -.05	.52 -.12	.64 -.2
45.20	B= -.28 C= .36	-.16 .28	-.03 .2	.09 .13	.21 .05	.34 -.02	.46 -.1	.58 -.18
45.15	B= -.34 C= .38	-.21 .3	-.09 .23	.03 .15	.15 .07	.28 0	.4 -.08	.52 -.16
45.10	B= -.4 C= .4	-.27 .32	-.15 .25	-.03 .17	.1 .09	.22 .02	.34 -.06	.46 -.14
45.05	B= -.45 C= .42	-.33 .34	-.21 .27	-.09 .19	.04 .12	.16 .04	.28 -.04	.41 -.11

- (－) means to decrease the thickness of washer.
- Since washer Ⓑ has only one kind (0.4mm) round the fraction at 0.2mm.
(Round off 0.2 or less.)
(e.g.)
Use 0 piece of washer for 0.19mm
Use 1 piece of washer for 0.34mm
Use 2 pieces of washer for 0.61mm

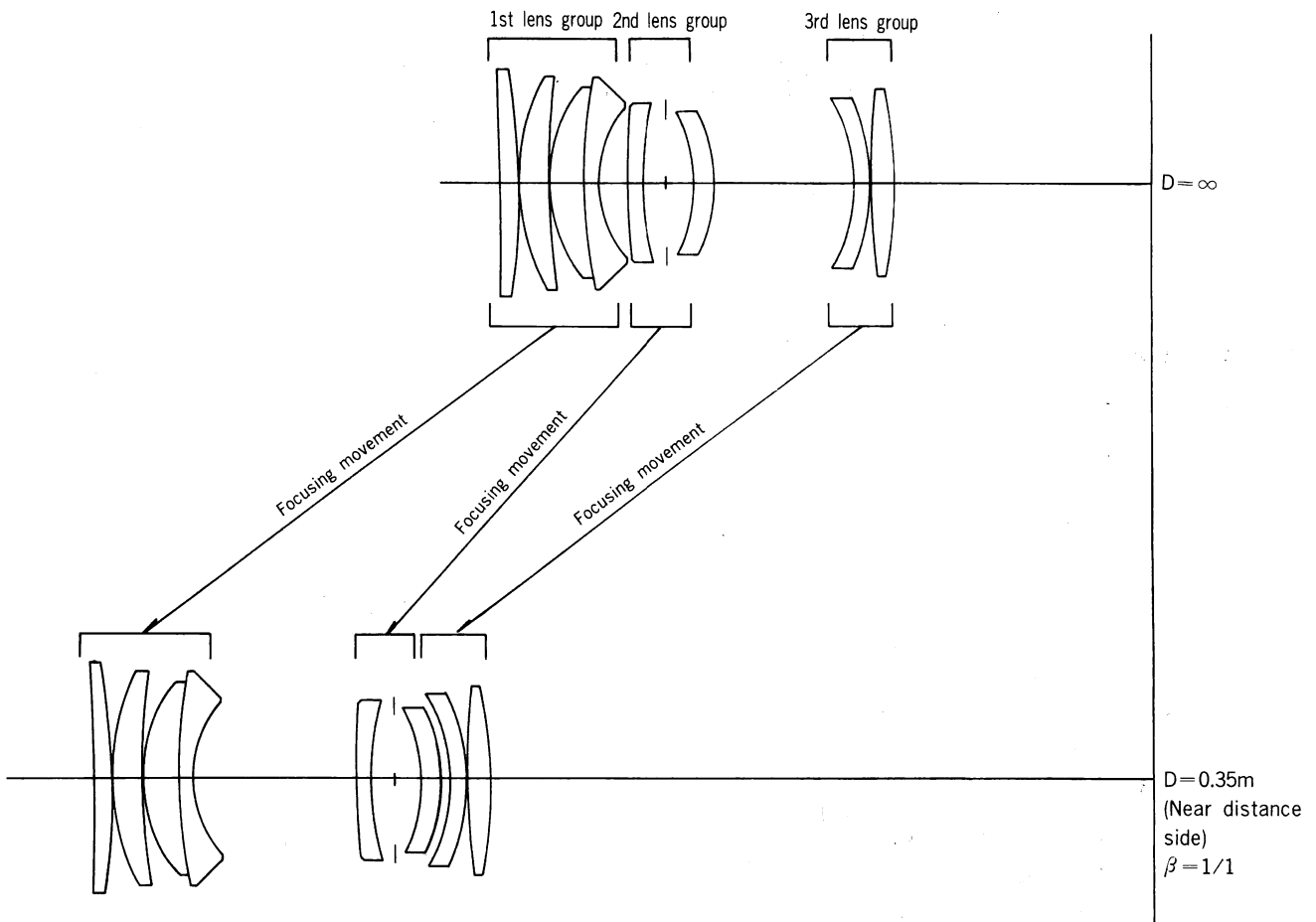
- In this example, Ⓑ=0.34, Ⓒ=－0.06. → Add 1 piece of back washer Ⓒ, and decrease the thickness of adjusting washer Ⓑ about 0.06mm.

⑤ Perform “1. Minute adjusting” on p.8.

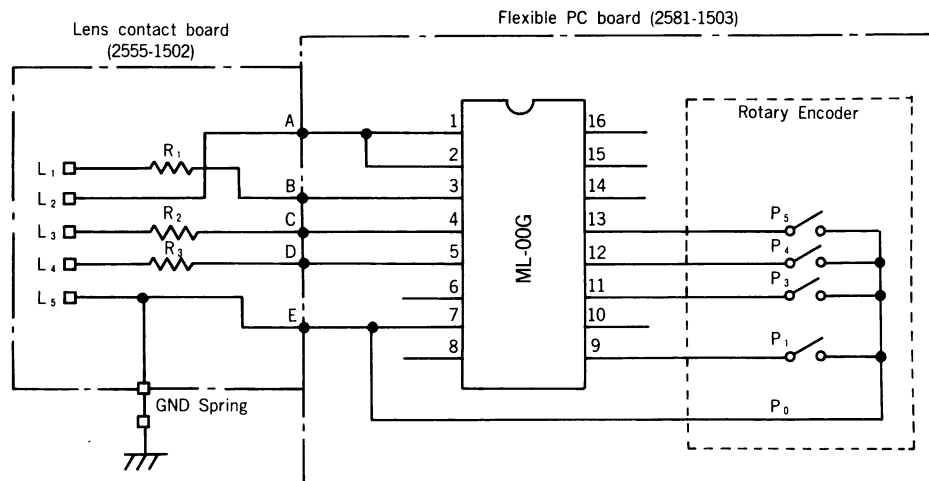
(You may need to repeat adjustings 1 and 2 several times.)

Description of focusing

- Lens construction : 8 elements in 8 groups.
- By rotating AF coupler or focusing ring, 1st, 2nd and 3rd lens group move separately. (Double-floating system)



■ Schematic circuit diagram, Printed wiring diagram(2581)



L_{1-5} : Lens signal contact

R_{1-3} : Printed resistor

ML-00G : ROM-IC

A-E : Soldering point

P_{0-5} : Rotary encoder pattern switch (ON/OFF by rotating focusing-ring)

